Integrating Quality and Values in Science Teaching:

A Techno-Psycho-Axiological Approach

A

Synopsis

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1. INTRODUCTION

The present scenario of brisk nuclear and technological advancements has enabled humans to relish the fruits of rapid industrialization, modernization, commercialization and globalization, but undoubtedly, this has come at the price of humanization. In fact, it would not be an exaggeration to point out that in their efforts to glorify quantification and cut-throat competition, men have inevitably ignored the sublime aspects of quality and values. Although, the realization of the grimness of the present scenario and anticipated consequential apprehensions has compelled everyone to ponder on these issues and take remedial actions for rectification, but there is still a lot which needs to be done in this direction. Perhaps, substantial success can be achieved in infusing quality and values in the society, only if persistent efforts are made to deal with the problem at the grass-root levels, and therefore, the responsibility seems to be more on the community of educators along with others such as scientists, sociologists, psychologists, etc. to probe into these issues and be the initiators of a culture which will be based on quality and values, so that these high ideals may gradually become part and parcel of the human society.

Education system has always been the harbinger of bringing improvements and developments in the human society, and it has achieved this by disciplining the cognitive faculty of the people, and also by channelizing their efforts towards advancements. It is therefore, that various commissions in India (University Education commission, 1948, p. 37; Secondary Education Commission, 1952, p. 96; Indian Education Commission, 1964, p. 25) and abroad (International Commission on Education, 1996, p. 202) from time to time have emphasized the need for the education system to focus on value inculcation and development of higher ideals among the learners, but unfortunately, as compared to the cognitive development of the learners and the materialistic advancement of society, progress in the sphere of emotive development and higher ideals has been extremely slow. And perhaps, this lack of interest on the part of educators in channelizing the human

instincts of learners towards achievement of higher virtues and ideals has resulted in the present condition of society, where we are far behind the standards of quality related to our daily life affairs, our ways of working and interaction with others, and even related to our personal management of our thinking, feeling and working.

In such a scenario, it appears that the efforts for infusing quality and values in society should begin by integrating these with the teaching process, from where these can further percolate in other social systems gradually through the learners. By orienting teacher-trainees to such teaching strategies which can help them in imbuing quality and values in their teaching process, and by making them conscientious of the need for focusing on these, it might become possible to initiate improvements not just in teaching process, but also in the emotive development of the learners.

With this background in mind in the present study, efforts will be made to develop a programme based on techno-psycho-axiological approach for integrating quality and values in the teaching process at the secondary level. Secondary level science teaching will be in focus owing to the persistent need for reformation in it as highlighted by the related research literature (Biswal, 2011, p. 22; Kumar, 2012, p. 91; Rani, 2007, p. 24; Rashtriya Madhyamik Shiksha Abhiyan, 2009, p. 1). Since, this kind of research requires in-depth analysis and interpretation of behavior, interests, attitudes, perceptions and ideologies of the teachers (or teacher-trainees), therefore, the research would be conducted predominantly through qualitative approach (Berg as cited in Ogunmade, 2005, p. 61; Bowen, 2005; Creswell & Clark, 2004; Mack, Woodsong, Macqueen, Guest & Namey, 2011) which enables the researcher not only to describe an event, but also to find the plausible causes of why something has occurred (Bottorff, 2000; Bowen, 2005; Mack et al., 2011). Quantitative methods of data collection and analysis will also be employed along with qualitative methods for the purpose of triangulation, and also for evaluating the effect on value based behavior and academic achievement of the students taught by the teacher-

trainees who have been oriented by the developed programme (based on Techno-Psycho-Axiological approach).

The sections 1.1 to 1.5 of the present research proposal highlights the conceptual understanding of the constructs related to it, and these are then followed by the sections describing the procedural aspects of the research.

1.1 Quality: Concept, Nature and Importance

When we talk about quality of something we compare one thing to the other by considering one of them as standard. Oxford Dictionary (2014) defines it as, the standard of something as measured against other things of a similar kind. Indeed, quality is needed in every sphere of life. Quality has been focused by almost every field for delivering better product. In the field of education, its quality has been emphasized over the years rigorously. For enhancing the quality of education we should consider the teaching quality as one of the most important factors.

For achieving quality in teaching, the two components of teaching process i.e. teacher and the students must be equipped with some desired characteristics. On the part of the learner, willingness to learn is foremost, while on the part of the teacher, many pre-requisites are necessary. These pre-requisites may contain in-depth content knowledge, effective classroom management, consistent excellence, love for the students, expertise in using instructional methods, willingness to teach, etc. (Goldberg, 2003). If these pre-requisites are there in a teacher then the aims of education could be achieved. Then the teacher will be known as quality teacher and the teaching as quality teaching.

1.1.1 Teacher quality indicators

Teacher quality indicators in a general sense are represented by the strategies or practices responsible for quality teaching. For instance, Killen (2007, p. iii) has written 9 teaching

strategies for outcome based education. These are: direct instruction; discussion; small-group work; co-operative learning; problem solving; research as a teaching strategy; role play; case study and writing. Shaddock (2007) suggested seven teaching strategies which a teacher should incorporate in his teaching for improving its quality. These are: teacher should be outcome focused; use conspicuous strategies; teach essential principles; link and integrate material; engage his students; provide students with support when needed; and systematically monitor students' performance. In fact, numerous studies have outlined teaching quality indicators, and some of the common indicators generally highlighted by the researchers (surveyed by the investigator in the available time) are active learning, regular feedback to students, etc. (Australian Professional Standards for Teachers, 2012; Flinders university, 2013; Lile & Keleman, 2014).

1.2 Values: Concept, Nature and Importance

'Values Deterioration' is one of the most disturbing issues in today's scenario. Various commissions and national policies on education have been advocating about value education. Indeed value education must be the core part of educational curriculum. This section throws light on the concept, nature and importance of values, which can be understood as ideals or lasting beliefs exhibited by the individuals of a particular culture. Values enable individuals to judge what is good or bad; and desirable or undesirable. Person's behavior and attitude are always guided by his values, and these serve as broad guidelines in all situations (BusinessDictionary.com, 2014). Values are those elements of one's life which he finds personally important. We always measure our choices against our values whether consciously or not. While justifying our behavior to ourselves and others, we often use them. Our level of satisfaction is also determined by them. Our values enable us to understand our roles in the society, and also act as strong motivating agents for actions.

Some values are general and common for all, and some values are particular to individuals. From others like friends, family, social, ethnic or national group, etc, values can be shared and particular values can be related to one's personality, needs and social context. Background, experiences, and one's evolving sense of self are the sources of one's own values. Combination of these sources serves to own values of an individual. Some values are constant throughout one's life, some may develop and change. Perhaps, since the real world is full of contingency and compromise, therefore, an individual is forced by his needs and circumstances to prioritize his values accordingly (Destinations, 2007).

1.2.1 Values related to teaching profession

Values are seen as driving forces, shaping lives of people and determine where energies have to be directed. Teaching profession also embodies certain core values which are expected to be followed by the teachers. General Teaching Council for Northern Ireland (2004) suggested core values of teaching profession which are: trust, honesty, commitment, fairness, equality, integrity, tolerance and service. This council further says that the heart of professional behavior is a commitment to serve and personnel related to teaching profession must have these values while working and also in their conduct when interacting with others. Teacher must be aware of his responsibilities to students, peers, and most importantly to the profession itself. Bektas and Nalcaci (2012) while focusing on values of teaching profession say that the teacher is the most important part of the education system and his impact on the pupils and education programme is considered as the highest aspect of education process. Teacher must practice his profession with love and passion and he should also accept his profession without any conditions. Similar to the need for having mastery over the content, a teacher also needs to possess values and attitudes related to the teaching profession. Car (2010) has also supported the above statement that teachers need

to have these principles and values not merely for regulating the activity of teaching, but for the formation of personality and character of themselves.

1.3 Status of Quality and Values in the Present Scenario

In spite of the immense importance being given to quality and values theoretically, the status of these in the practical world in the present time does not seem to be significant. Seth and Aneja (2014) have indicated towards serious effects of value deterioration in India, and also mentioned that depletion of values has become a common phenomenon in most of the countries. In fact depletion of values among the citizens of a country poses serious threat to its future development and also to its respect, survival and authority. In India depletion rate is far more than any other country, which is why teachers, parents and society must understand this and try to inculcate desired human values in the younger generation. Krishna (n. d.) has also canvassed that in the present scenario of improved opportunities for education, there is also a visible increase in the level of greed and selfishness of the people. This is perhaps because employment, examination and empowerment have become synonyms to education and have been focused more rather than focusing on real meaning of education, i.e., emancipation, ennoblement and evolution. Therefore, in the present times we are in a dire need for inculcating human values among the young generation and for enabling them to imbibe necessary values by giving them quality education.

If we talk about the status of teaching quality in the present scenario, we are still devoid of those indicators that can be used to assess teaching quality (Rice, 2004). We are focusing on increasing access to the education instead of focusing on quality teaching improvement in the country (Dutta, 2013). Hence, the status of quality teaching would not be satisfactory until the quality teaching strategies and quality indicators are identified and practiced. Even the National Curriculum Framework for School Education (2000, p. 70) under the

chairmanship of Prof. Yashpal, emphasizing on the need for every teacher to be a teacher of values, has said that every action of teacher should conform to value identification, inculcation and reinforcement in a judicious and balanced manner.

1.4 Need for Focusing on Both: Quality and Values as Twin Strands of Educational Double Helix

Education having the potential to develop values among the students could only be provided through quality teaching. Lovat and Toomey (2009, p. 143) in their book named "Values Education and Quality Teaching" called values education and quality teaching as two complimentary strands of DNA molecule i.e., Double Helix. In this very book, Lovat (2009) wrote a chapter with the name "Values Education and Quality Teaching: Two Sides of the Learning Coin". Both of these authors have suggested the interdependence of values education and quality teaching. In order to find out possible links between values education and the world of teachers and schools for making values education part and parcel of mainstream schooling, Lovat (2005, p. 2) found that, "We live in a time when our understanding of the role of the teacher and the power of values education are coalescing. No longer is values education on the periphery of the central roles to be played by the teacher and the school in our society. It is at the very heart of these roles". Certainly, for bringing sustainable improvement in the quality of a system or a process, values have to be adhered to, and this integration of values in the system can only be made successful when quality is present. Quality and Values are complementary to each other and cannot stand in isolation from each other for a long period. Therefore, in the present study efforts will be made to develop a programme incorporating such strategies and practices based on techno-psycho-axiological approach which will enable the teachers not only to improve their teaching qualitatively, but also to remain conscious about the values of teaching profession.

1.5 Techno-Psycho-Axiological Approach for Quality Enhancement and Value Integration in Teaching

Realizing the grimness of the present times when standards related to quality and values are facing challenges, various concerns are being raised and rigorous steps are being taken at all levels for improvement. Since, quality and values are sensitive issues which involve human feelings and behavior, therefore, simply focusing on only technology, or psychology, or sociology, or philosophy for their integration in teaching can not be justified. Each of these can help in combating the problem only partially. Therefore, there appears a need for an approach which can combine important aspects of technological advancements in a psychologically sound manner with an axiological perspective for integrating quality and values with teaching. Although, utilization of technological facilities can equip the teachers to make teaching process interesting and more effective, but it needs to be combined with research findings and theories of psychology so as to make the classroom interactions more worthwhile and objective oriented. Understanding the characteristics of learners and the measures for improving learning through the appropriate stimulation of senses, are some essentials in the absence of which the use of technology becomes superficial only. Furthermore, utilization of technology and psychological principles can result in real and sustainable improvements in teaching and the learners, only when these are founded on the strong grounds of axiology (the philosophical study of values). The axiological perspective widens our perspective enabling us to understand how all the objects, events, living beings are inter-connected in a form of esoteric system, and also makes us realize the need for striving for ideals and perfection for a better world order. Without consideration for axiological perspective, even the most advanced use of technology and psychology can never lead to true success of teaching. Therefore, the present study will be based on the techno-psycho-axiological approach.

2. STATEMENT OF THE PROBLEM

On the basis of the reflections made in the previous sections regarding the immense need for infusing quality and values in teaching process, the problem of this study can be stated as: *Integrating Quality and Values in Science Teaching: A Techno-Psycho-Axiological Approach.*

3. RATIONALE FOR CONDUCTING THE PRESENT STUDY

Many attempts have been made over the years in order to isolate the indicators of quality teaching. Researchers are still not in a comfortable position to state which indicators of quality teaching are quite promising and which are not. Quality teaching indicators have always been in a debate, various researchers are claiming their findings as promising indicators of quality teaching, but still, there exists situation of uncertainty. In context of this debate, Editorial Projects in Education Research Centre (2011, p. 1) has commented that research findings indicate that good teaching always matters, but there are still zones of uncertainty regarding which factors and practices will help promote high-quality teaching.

On reviewing various meta-analysis on quality teaching, one feels that studies are counteracting each other. Except one or two indicators that are consistently defining quality teaching, researchers have not yet arrived at some substantive conclusion. In the introductory part of his meta-analysis on 'Teacher Quality and Student Achievement', Goe (2008, p. 1) says, "Research has not been very successful at identifying the specific teacher qualifications, characteristics, and classroom practices that are most likely to improve student learning. Unfortunately, this is just the information that educational policymakers need most". After completion of his meta-analysis he further says that first five years of teaching experience and teachers' mathematic knowledge are only two indicators that are

contributing to student learning, but still researchers have not been successful in identifying other teacher aspects responsible for students learning (Goe, 2008).

It is evident from the above statements that we are still devoid of information about quality teaching. Clear cut strategies, practices, characteristics, must be identified to unveil the promising indicators of quality teaching. Therefore, the investigator has felt the need for exploring feasible effective teaching strategies based on techno-psycho-axiological approach, and giving them a form of ten-day orientation programme for integrating quality and values in the teaching process at secondary level. Along with this, the present research will also focus on issues such as: measures for implementing the teaching strategies for infusing quality and values effectively in the teaching process, problems arising at the time of implementation of these strategies in the classroom and their causes, classroom events indicating success or failure of these strategies, effectiveness of the developed programme in enhancing the quality of teaching and making it values oriented, effectiveness of teaching based on the developed programme on students' academic performance and values, etc. The sample for the present study will include teacher-trainees (of science pedagogy) and the proposed ten-day orientation programme based on techno-psycho-axiological approach is expected to enable them to understand various aspects of quality and values in general and as related to teaching process, and to acquaint them with the ways for incorporating strategies based on techno-psycho-axiological approach in teaching.

Qualitative approach of research will be predominantly employed in the study because this type of research needs in-depth and intensive investigation dealing with subtle factors of teaching process, which cannot be studied using quantitative approach alone which reduces human behavior and characteristics to some numbers, without giving much opportunity to get to know the hidden causes of the visible effects. However, quantitative methods will also be used to study the effect of teaching (by the teacher-trainees oriented through the

developed programme) on academic achievement and value based behavior of the secondary level students. Finally, on the basis of the findings of the present study, a final draft of the developed programme will be framed as the product of the research hoping that it will be utilized by the interested science teachers and teacher-trainees for improving the quality of their teaching and integrating values in it.

4. DEFINITION OF THE IMPORTANT TERMS

The main terms used in the statement of the problem of the present study have been defined operationally in this section.

4.1 Techno-Psycho-Axiological Approach

In the present study, the orientation programme for teacher-trainees (of science pedagogy) will be based on techno-psycho-axiological approach which implies that the programme will include the ideas and strategies based on technology and psychological insights, founded on axiological perspectives. The approach will focus on meaningful combination of *technological advancements* (and how these can be used for improving teaching practices for facilitating better learning) with *psychological* theories and research findings related to learning and teaching, keeping in view the sublime axiological perspective (so that values remain the focal point of the approach).

4.2 Quality

Oxford Dictionary (2014) defines it as "The standard of something as measured against other things of a similar kind; the degree of excellence of something".

The present study will be conducted with a focus on teaching quality which implies quality teaching strategies like small-group work, co-operative learning, problem solving, etc. (Killen, 2007). Using peer and team work, adjusting the amount of output required, preparing student for the future, using a range of opportunities to demonstrate what has

been learnt, etc. (Queensland Government, 2005). Many more established strategies will be explored to include them in the orientation programme for integrating quality and values in science teaching.

4.2 Values

Values have been defined by Oxford dictionary (2014) as "Principles or standards of behavior; one's judgement of what is important in life".

This will include the necessary values (inculcation of scientific temper, democratic attitude, honesty, truthfulness, humility, empathy, dedication, commitment to the principles of secularism and social justice, etc.) which could be infused in the science teaching process as well as in the students' behavior through the developed orientation programme.

5. PURPOSE AND RESEARCH QUESTIONS OF THE STUDY

The purpose of the study will be to integrate quality and values in science teaching at secondary level using techno-psycho-axiological approach. More specifically the study will address the following questions:

1. How the techno-psycho-axiological approach can be employed for integrating quality and values in science teaching process at secondary level in Indian scenario?
2. How can an orientation programme for teacher-trainees be developed (on the lines of techno-psycho-axiological approach) and implemented effectively and efficiently in science teaching?
3. What are the implicit and explicit hurdles which obstruct teachers (or teacher-trainees) in following or adopting this approach (related teaching strategies) in their teaching?
4. Which classroom events indicate success or failure of this approach?
5. To what extent is this approach successful in integrating quality and values with the science teaching process at secondary level?

6. To what extent the integration of quality and values with science teaching can lead to value inculcation among the students?
7. To what extent the integration of quality and values with science teaching can lead to improvement in academic achievement of the students?

6. OBJECTIVES OF THE STUDY

The present study will be conducted by fulfilling the following objectives:

1. To develop an orientation programme based on techno-psycho-axiological approach for teacher trainees.
2. To orient the teacher-trainees (of science teaching-method) through the developed ten-day orientation programme.
3. To evaluate the effect of the developed orientation programme (based on techno-psycho-axiological approach) on the level of quality enhancement of science teaching at secondary level.
4. To evaluate the effect of the developed orientation programme (based on techno-psycho-axiological approach) on the level of value integration in science teaching at secondary level.
5. To evaluate the effect of science teaching (based on the developed orientation programme for quality and value integrated teaching) on the level of value development among the secondary school students.
6. To evaluate the effect of science teaching (based on the developed orientation programme for quality and value integrated teaching) on the academic achievement of the secondary school students.

For achieving the first four objectives (no.1 to 4) of the study qualitative research approach will be employed and for the objectives no. 5 and 6 quantitative approach will be utilized.

7. HYPOTHESES OF THE STUDY

Related to the objectives no. 5 and 6 of the study, the hypotheses will be:

1. There will be positive effect of science teaching (based on the developed orientation programme for quality and value integrated teaching) on the level of value development among the secondary school students.
2. There will be positive effect of science teaching (based on the developed orientation programme for quality and value integrated teaching) on academic achievement of the secondary school students.

8. DELIMITATION OF THE STUDY

Keeping in view the qualitative nature of the study, it will be delimited to:

1. Six teacher trainees (of science teaching pedagogy), pursuing B.Ed. from Dayalbagh Educational Institute (Deemed University) Agra.
2. Secondary Schools affiliated to Dayalbagh Educational Institute, Deemed University, Agra (in which these teacher-trainees will have their internship).
3. Students studying in secondary level classes (Class 6 onwards) taught by these six teacher-trainees.

9. METHOD OF THE STUDY

Generic qualitative method will be utilized in the present research because Merriam (as cited in Caelii, Ray, & Mill, 2003) has the view that this method illustrates the features of qualitative research, but rather than ethnographic method that focuses on culture, or the grounded theory that builds theory, 'it focuses on discovering and understanding a process, or the perspectives, a phenomenon and worldviews of the people involved'. Although, the research approach will be predominantly qualitative, but also incorporate quantification wherever necessary for better understanding of the sample of the study (demographic data of the study), triangulation and verifying the findings, and for evaluating effect of science teaching (based on the strategies incorporating techno-psycho-axiological approach) on value development and academic achievement of the students (taught by the oriented science teacher-trainees). Quasi-Experimental with Pre-Post Test research design will be utilized for this quantitative analysis.

10. PROCEDURE OF THE STUDY

The conduction of the present study will include the following steps:

Step 1: *Development of Orientation Programme*

A Programme will be developed by incorporating effective strategies and practices based on recent trends and technology, recent findings from the field of psychology with an axiological perspective. For this objectives of the programme will be specified, techniques for getting feedback from teacher-trainees during and after the orientation will be devised, selection and outline of the modules to be delivered will be made, content to be delivered through the modules will be explored and organized systematically using psychological principles.

Step 2: *Data Collection and Analysis before Orientation*

Present status of teaching quality and teaching values of the selected teacher-trainees (≈6) will be obtained by the use of self-made Teaching Quality Observation Schedule (TQOS), self-made Teaching Values Observation Schedule (TVOS), Reformed Teaching Observation Protocol (RTOP) developed by Piburn and Sawada (2000) and through interviews from the selected science teacher-trainees. Pre-test of students' achievement and values will also be taken quantitatively by using self-made Science Achievement Test and self-made Value Assessment Test.

Step 3: *Orientation Programme (Ten-Day)*

After taking present status of the conditions of the teaching quality and teaching values and pre-test of the students about science achievement and values, selected teacher-trainees will be oriented through the developed programme based on techno-psycho-axiological approach for ten days (two hours session per day). During the orientation programmme teacher-trainees will be provided relevant reading material; relevant video clips, animations, simulations will be shown, lectures by teacher educators will be provided and practical sessions will also be conducted. Sampled teacher-trainees (selected from the group of oriented science teacher-trainees) will be asked to incorporate teaching strategies based on techno-psych-axiological approach in their science teaching for about three months. Researcher will support teacher-trainees regarding the practical implementation of various strategies in class, overcoming difficulties during the implementation of developed programme, and in other possible manner as the need be.

Step 4: *Data Collection and Analysis after Orientation*

In this phase data collection and analysis will be carried out at regular intervals by utilizing qualitative approach of analysis, as the researcher will remain in regular touch with the selected teacher-trainees carefully collecting information using qualitative approach about the difficulties, challenges, success, etc. which may arise while teaching by the oriented science teacher-trainees. The qualitative tools will be the same as mentioned in the step 2. Again final status of teaching quality and values will be assessed using the same procedures as used in step 2 and then the previous status (step 2) and final status (step 4) of teaching quality and teaching values will be compared qualitatively. After three months of teaching, post-test of students' (taught by the science teacher-trainees oriented though the developed programme based on techno-psycho-axiological approach) science achievement and value developement will also be taken quantitatively and compared with the pre-test of the same (step 2) for assessing the effectiveness of the teaching (based on techno-psycho-axiological approach).

For better understanding of the design of the study, it has been presented in the form of a flowchart in the Figure no. 1 on page no. 18.

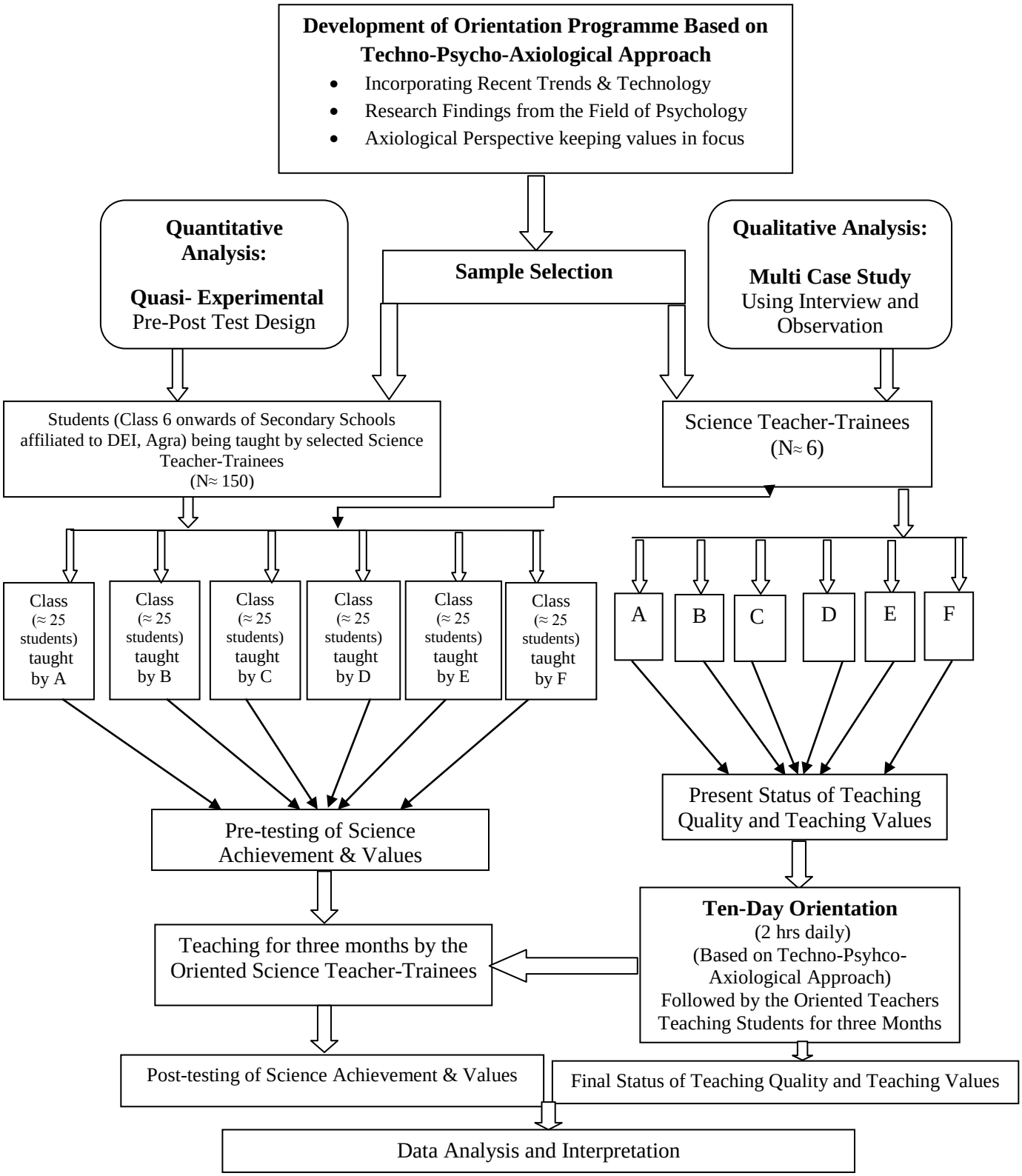
Development of Orientation Programme Based on Techno-Psycho-Axiological Approach
Incorporating Recent Trends & Technology
Research Findings from the Field of Psychology
Axiological Perspective keeping values in focus
Quantitative Analysis:
Quasi- Experimental
Pre-Post Test Design
Sample Selection
Qualitative Analysis:
Multi Case Study
Using Interview and Observation
Students (Class 6 onwards of Secondary Schools affiliated to DEI, Agra) being taught by selected Science Teacher-Trainees
(N≈ 150)
Science Teacher-Trainees
(N≈ 6)
Class (≈ 25 students) taught by A
Class (≈ 25 students) taught by B
Class (≈ 25 students) taught by C
Class (≈ 25 students) taught by D
Class (≈ 25 students) taught by E
Class (≈ 25 students) taught by F
A
B
C
D
E
F
Pre-testing of Science Achievement & Values
Present Status of Teaching Quality and Teaching Values
Ten-Day Orientation
(2 hrs daily)
(Based on Techno-Psyhco-Axiological Approach)
Followed by the Oriented Teachers Teaching Students for three Months
Teaching for three months by the Oriented Science Teacher-Trainees
Post-testing of Science Achievement & Values
Final Status of Teaching Quality and Teaching Values
Data Analysis and Interpretation

Figure 1. Research Design of the Study

11. SAMPLE FOR THE STUDY

Qualitative approach which emphasizes on in-depth investigation in a small number of samples will use purposive sampling. Approximately Six teacher trainees of science teaching pedagogy pursuing B.Ed. from Dayalbagh Educational Institute (Deemed University) Agra, who will have their internship in secondary classes (class VI onwards) of schools affiliated to Dayalbagh Educational Institute, Deemed University, Agra will be approached for this type of work. Only those teacher trainees will be selected who will show their interest and must be capable. Sample is always a small one in qualitative type of researches because we are focusing on quality and not quantity (Bowen, 2005, p. 217). Approximately 25 students will be taken from each teacher-trainee's class (Total 6*25=150) for taking quantitative data.

12. TOOL FOR THE STUDY

Reformed Teaching Observation Protocol (RTOP) developed by Piburn and Sawada (2000), permission for using this tool will be taken from the authors and will be adapted according to the Indian situations. Self-made Teaching Quality Observation Schedule (TQOS), Self-made Teaching Values Observation Schedule (TVOS), Video-recording, open-ended interviews, observation will be the main research instruments. Combination of these three instruments will be utilized for emphasizing triangulation; cross checking data gathered through different tools for checking reliability of data (Brynman, 2000). Computer assisted tools for qualitative data analysis will be used depending upon the nature of data and need. Self-made Science Achievement Test and Self-made Values Assessment Tool will be utilized for quantitative analysis along with Mean, Standard Deviation and T-Test or Critical Ratio Test as statistical techniques.

13. DATA COLLECTION

In-depth Interviews of teachers with reference to quality teaching and values (what they do about quality of teaching and inculcating values among their students), video recording of their teaching, observation of their lectures will provide the present status of teaching quality and teaching values. Pre-test of Science achievement and values of students will be taken. After suggesting strategies for quality teaching and value education to them to be incorporated in their teaching, again observation of their lectures, video recording of their lectures, quantitative data from students about their achievement and values (post-test) or interviews from the students (if necessary) will be done and considered as final status. Then present and final status will be compared for arriving at conclusions.

14. DATA ANALYSIS

Data will be analyzed by using qualitative approach like organizing the data, finding and organizing ideas and concepts, making broad themes in the data, checking reliability and validity during analysis, finding possible explanations for findings, making an overview of the final steps (Connor & Gibson, 2002, p. 65). Quantitative analysis of data will also be utilized along with Mean, Standard Deviation and T-Test as statistical techniques.

15. PROPOSED CHAPTERIZATION OF THE STUDY

A proposal of organization of chapters in the present study is outlined in this section.

Chapter I: Conceptual Framework

Chapter II: Review of Related literature.

Chapter III: Procedure of the Study

Chapter IV: Data analysis and Interpretation

Chapter V: Findings of the Study

16. CONCLUSION

The present chapter has thrown light on the importance of quality teaching and its present scenario, which needs to be improved for integrating quality and values in the teaching process. The proposed draft of an orientation programme based on techno-psycho-axiological approach will be beneficial for the teacher-trainees and in-service teachers for the development of values among the secondary level students and for their better academic performance. The concepts of quality teaching strategies and values education have also been discussed along with their desired incorporation in the teaching-learning at secondary level. With reference to above points, statement of the problem of the study and the rationale for conducting it have also been pointed out.

To enable the readers to get an overview of the study, a brief report of the entire procedure to be adopted for the successful completion of the study, including the objectives, research design, various phases, sub-phases and steps, samples to be selected, tools and techniques to be employed, has also been discussed in this chapter.

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